

DIFFERENTIAL HABITAT SELECTION IN THE LEPIDOPTERA: A NOTE ON DECIDUOUS VERSUS CONIFEROUS WOODLAND HABITATS

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In July 1984, a short excursion was made to north and mid-Wales. The main purpose was to collect samples of the grass *Agrostis tenuis* from disused copper mine tips, and to look for ladybirds. But a couple of Heath moth traps were taken, for use if suitable sites were found. The two traps were set up on South Stack Heath, Anglesey (SH 217 802; SH 218 802) on the night of July 11th. It was a windy night and the catch was disappointingly low in both traps; there was nothing unexpected and only 44 moths of 8 species were recorded. The visit to Anglesey was disappointing for other reasons. We had hoped to sample graylings (*Hipparchia semele*) from the Great Orme's Head site where dwarf forms are supposed to occur (Ford, 1957), but none were found in the cloudy conditions. Ladybirds were also scarce, and a long search of a coniferous plantation (Newborough Forest, SH 403 648) resulted in only a few adults. In addition, the copper mine tip at Parys Mountain (SH 904 445) was found to be almost totally denuded of *A. tenuis* probably as a result of previous sampling excursions by university lecturers and researchers.

Consequently, we moved south to Drws-Y-Coed where plentiful supplies of *A. tenuis* were found on a disused mine tip (SH 544 533). During the day ladybirds were sought at several sites, but they were still scarce, though reasonable numbers of *Aphidecta oblitterata* and *Adalia decempunctata* were found in Ystwyth Forest (SN 661 729).

On the night of the 12th., the moth traps were set up 20 yards apart, on either side of a lane near Ynys-Hir, Dyfed (SN 686 947). This lane divided a conifer plantation from an area of mixed deciduous woodland. The conifer in question was douglas fir, and there was very little ground vegetation, though there was some ivy on the trees close to the trap. On the other hand, the deciduous wood was extremely heterogeneous, containing hazel, sycamore, birch, field maple, oak, elm and hornbeam; and there was a rich ground vegetation with bramble, bracken and honeysuckle being most dominant, together with many other species of broad-leaved plants and grasses. The subsequent catches in the two traps following the positioning of one amongst the conifers the other amongst the deciduous trees has enabled an interesting comparison to be made of the effect of these two different, but almost adjacent habitats.

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The total catches are given in table 1. It is perhaps not unexpected that trap 1, which was sited in the deciduous woodland produced nearly twice as many species as trap 2.

Thirteen species were found in both traps. Only 7 species of moths taken in trap 2 were absent from trap 1. Of these, the commonest, the barred red (*Hylaea fasciaria* L.) is of course, associated with coniferous woodlands, as the larvae feed on scots pine and a range of other conifers. Similarly, the larvae of the grey pine carpet (*Thera obeliscata* Hb.) feeds on scots pine. The occurrence of the other five species taken in trap 2 but not in trap 1 is of less significance as only 1 individual of each was recorded. Certainly, there is no obvious association between conifers and any of these species.

Of the 23 species taken in trap 1 but absent from trap 2, none has a particular association with conifers; the larvae of all the species feed on deciduous trees or a range of low growing herbaceous plants and grasses. One or two species were of particular note to us. It was a pleasure to see both the scarce silver-Y (*Syngrapha interrogationis* L.) and the beautiful snout (*Hypena crassalis* Fab.), as these do not occur in East Anglia. The satin lutestring (*Tetheella fluctuosa* Hb.) was also of interest, for although we have seen this before in Staffordshire, these three specimens were the first non-melanics we have seen. It is of note, but quite expected, that all the peppered moths (*Biston betularia* L.) taken were of the typical nominate form.

On the whole this catch tended to make the trip rather more worth while than it had been hitherto, and the sharpness of the distributions of some of the species to their preferred habitats surprised us. But undoubtedly, the most interesting feature of the whole trip concerned the two commonest species of moth that we took.

Almost a hundred individuals of the mottled beauty (*Alcis repandata* L.) were recorded; 41 in trap 1 and 58 in trap 2. The majority were of the nominate form, however, 11 were of the banded form f. *conversaria* Hb., and two of a melanic form either f. *nigricata* Fuchs or f. *nigra* Tutt; the former according to Kettlewell (1973) being a non-industrial melanic and the latter an industrial melanic. The amazing thing was that all the darker forms were taken in trap 2. Kettlewell has suggested that f. *nigricata* exists in a polymorphism with the typical form in the Black Wood of Rannoch, Perthshire, a relict Caledonian pine forest. Although it is more conspicuous when it rests on pine trunks, it is less so when it has to take to the wing during the day in the rather poor light under the pine canopy. The light conditions in the deciduous wood were certainly much brighter than under the conifers, and so Kettlewell's contention might have a bearing on the distribution of the dark forms we found.

Species	Trap 1	Trap 2
<i>Alcis repandata</i> Linn.	41	58
<i>Semiothisa liturata</i> Cl.	8	26
<i>Polia nebulosa</i> Hufn.	8	7
<i>Idaea aversata</i> Linn.	7	2
<i>Diarsia brunnea</i> D. & S.	3	2
<i>Polia hepatica</i> Cl.	2	2
<i>Nudaria mundana</i> Linn.	1	1
<i>Spilosoma luteum</i> Hufn.	1	2
<i>Apamea remissa</i> Hb.	1	1
<i>Campaea margaritata</i> Linn.	1	3
<i>Noctua pronuba</i> Linn.	1	1
<i>Lacanobia oleracea</i> Linn.	1	1
<i>Mesapamea secalis</i> Linn.	1	1
<i>Diarsia mendica</i> Fabr.	4	
<i>Tetheella fluctuosa</i> Hb.	3	
<i>Biston betularia</i> Linn.	2	
<i>Eulithis populata</i> Linn.	2	
<i>Herminia tarsipennalis</i> Treit	2	
<i>Cerapteryx graminis</i> Linn.	2	
<i>Geometra papilionaria</i> Linn.	1	
<i>Ecliptopera silaceata</i> D. & S.	1	
<i>Lomographa bimaculata</i> Fabr.	1	
<i>Apeira syringaria</i> Linn.	1	
<i>Ectropis bistorata</i> Goetze.	1	
<i>Ectropis crepuscularia</i> D. & S.	1	
<i>Scotopteryx mucronata</i> Heyd.	1	
<i>Habrosyne pyritoides</i> Hufn.	1	
<i>Ptilodon capucina</i> Linn.	1	
<i>Hypena crassalis</i> Fabr.	1	
<i>Syngrapha interrogationis</i> Linn.	1	
<i>Xestia triangulum</i> Hufn.	1	
<i>Hoplodrina blanda</i> D. & S.	1	
<i>Rusina ferruginea</i> Esp.	1	
<i>Apamea crenata</i> Hufn.	1	
<i>Euplexia lucipara</i> Linn.	1	
<i>Caradrina morpheus</i> Hufn.	1	
<i>Hylaea fasciaria</i> Linn.		9
<i>Thera obeliscata</i> Hb.		2
<i>Mesoleuca albicillata</i> Linn.		1
<i>Eupithecia vulgata</i> Haw.		1
<i>Phalera bucephala</i> Linn.		1
<i>Mythimna ferrago</i> Fabr.		1
<i>Xestia ditrapezium</i> D. & S.		1

Table 1 A comparison of species taken in two Heath traps on the night 12/13 July. The traps were situated 20 metres apart, trap 1 in deciduous woodland and trap 2 in a conifer plantation.

Yet it suggests that the *conversaria* and *nigricata* forms have a very strong habitat preference for the conifer area or alternatively an aversion to the lighter conditions of the deciduous wood.

The situation with respect to the tawny-barred angle (*Semiothisa liturata* Clerck) was even more spectacular. Not surprisingly, the majority of the specimens of this pine feeding species were taken in the conifer wood, 36 compared with 9 in the deciduous wood. Of those taken, 21 were of the melanic form *nigrofulvata* Collins. All except one of these melanics were taken in trap 2, that is to say, the conifer trap. That the melanic form should comprise 53.33% in the conifer plantation and only 11.1% in the deciduous wood suggests to us that the forms of this species also have some method for distinguishing between their habitats or surroundings.

It is known that the different forms of some species of moth select fairly specific backgrounds to rest on (see Sargent, 1969; Kettlewell, 1973; Boardman, Askew and Cook, 1974; Majerus,

1982). From our brief observations it seems that the different forms can also distinguish between the conditions surrounding them in some way. The range of differences between the catches in two traps set so close together, but in such different environments, calls for other similar sites to be found and more extensive research to be done.

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EUPROCTIS CHRYSORRHOEA L. (BROWNTAIL MOTH) IN NORTH HAMPSHIRE — Further to T. G. Winter's note (*Ent. Rec.* **98**: 209) an m.v. light operated at Kemsholt (SU 605495) attracted brown-tail moths as follows: 16.vii.1983 (2); 7.vii.1984 (1); 11.vii.1984 (1) and 14.vii.1985 (1). Also in V.C. 12, at North Warnborough (SU 728536) 2 were recorded on 17.vii.1983. All dates refer to the morning of inspection, and all moths were males. During the 3 years of operating an m.v. at Kempsholt, *chrysorrhoea* was recoded in each year, suggesting that it is established locally. J. W. FRADGLEY, The White House, Merley Park Road, Ashington, Wimborne, Dorset.